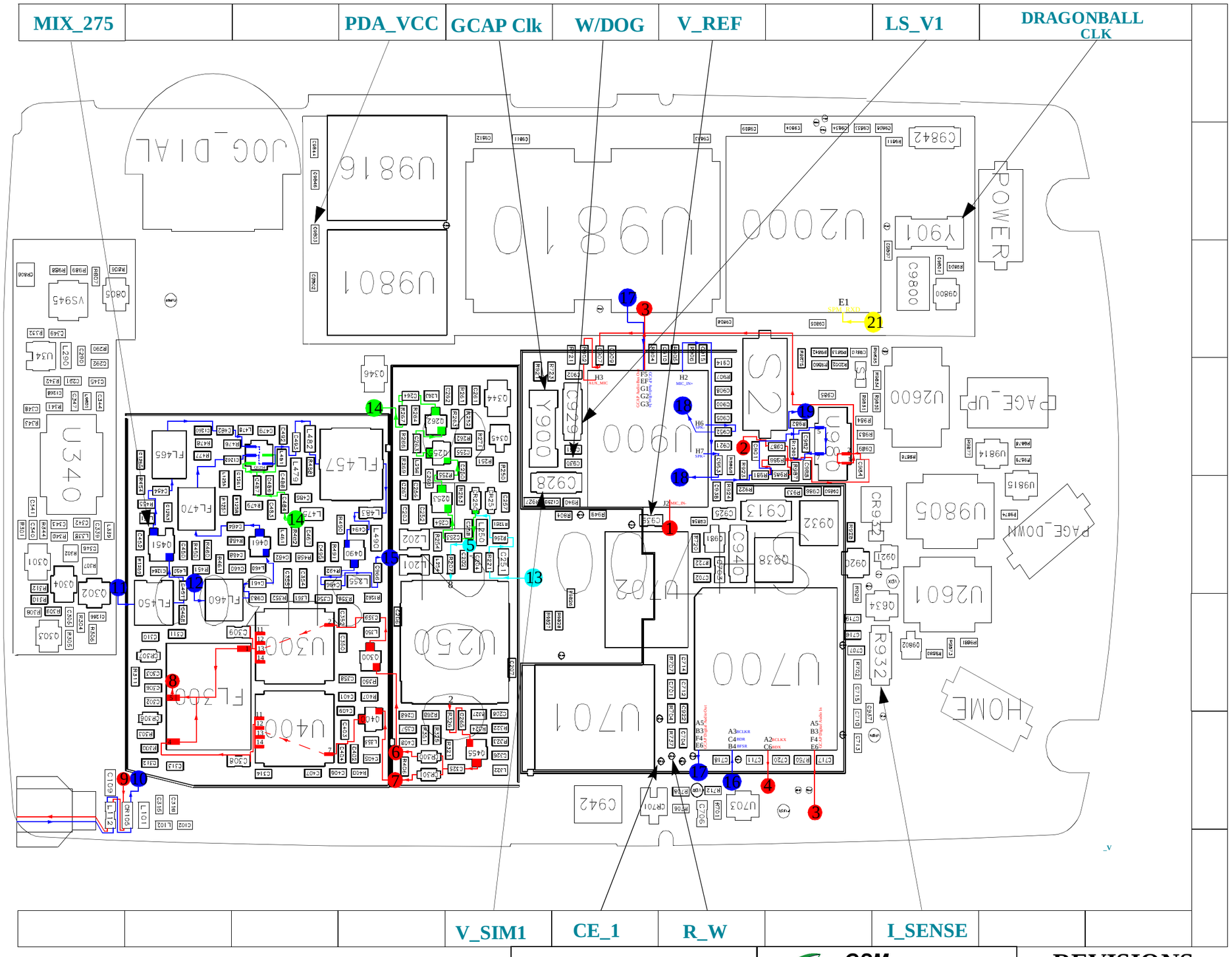
TAI CHI ORGANISER

MIX_275 | | | PDA_VCC | GCAP Clk | W/DOG | V_REF | | LS_V1 | DRAGONBALL CLK



TX

1. Analogue Mic Audio.
2. Analogue Headset Audio.
3. GCAP Bus Digital Audio.
4. Processed speech and error correction data.
5. TX VCO Tuning voltage with modulation.
6. GSM 1800 main TX o/p frequency
7. GSM 900 main TX o/p frequency
8. Amplified Main TX o/p
9. Main TX o/p to Antenna

RX

10. Received Frequency
11. GSM1800 Received Frequency
12. GSM900 Received Frequency
13. RX VCO Tuning Voltage
14. Main VCO Frequency
15. 400Mhz IF Frequency
16. Demodulated and Digitized Received Data
17. Digital GCAP Bus Audio
18. Analogue audio to Speaker
19. Analogue Audio to Headset

PDA

20. PDA Touch screen analogue positional information.
21. PDA Touch Screen digital positional information.

Motorola Use Only

GSM Service Support Level 3 Authorized

REVISIONS

GSM Service Support	08.12.99
LEVEL 3 SIGNAL FLOW	Rev. 1.0
TAI CHI Organiser	Ver P5.0
Michael Hansen, Ray Collins, Ralf Lorenzen	

RX SIGNAL PATH
TX SIGNAL PATH
MAIN VCO SIGNAL PATH
TUNING VOLTAGES
13 MHz REFERENCE CLOCK
DATA BUS
ADDRESS BUS
TEXT REFERENCE SIGNALS

GSM Service Support
Level 3 Authorized

TAI CHI - ORGANISER P5.0

GSM_LNA

GSM_LNA275 MIX_275 Ref #'s 450-469

FL460 942.5MHz 01-04545-002
FL470 1.15GHz
Q461 NE85715 48-00952-0E30
FL465 942.5MHz
FL450 897.5MHz 01-04545-001
Q451

MIXER

Ref #'s 470-489
MIXER
L475, L482 SHOULD BE 24-00350L SERIES
GSM_LNA275 MIX_275 DCS_LNA275
L475 24-00350L-4N7S
L482 24-00350L-6N8S
Q1254 Q1254
FL457 942.5MHz

ISO_AMP

Ref #'s 450-500
Q490 NE85715 48-00952-0E30

DCS_LNA

DCS_LNA275 MIX_275
FL450 897.5MHz 01-04545-001
Q451

RF SWITCH

A1 48-01740-0E01
DCS_LNA275 GSM_LNA275 PAC_275 MIX_275
U101 Q101 Q102 Q103 Q104 Q105 Q106
SW_RF -5V_SW -5V MIX_275 PAC_275 RE_V2

RX VCO

RVCO_250 Q262 SF_OUT Q255 Q253
DCS_VCO CR250 CR251

Ref #'s 300-350
DCS_SEL GSM_LNA275 GSM_SEL MIX_275 DCS_LNA275 Q342
GSM_SEL RVCO_250 DCS_VCO Q345
RE_V2 MIX_275 Q340 RX_EN

Ref #'s 100-150
NPA_MUTE TX_EN RE_V2 PAC_275 GSM_PINDIODE Q320 DCS_SEL Q321 Q322 -5V

Ref #'s 450-500
RE_V2 Q344 SF_OUT RVCO_250
TVCO_250 Q343 SF_OUT TX_EN
V1_FILT V1_SW Q346 TX_EN

NOTE: All other connections are ground.

RE_V2 Q255 RE_V1 V1 RE_V2 RE_V1 V1 RE_V1
BCLKX RX_VCO GPO3 GPO4 GPO5 GPO6 GPO7 GPO8 BUSX
MAGIC 13Mhz BCLKX CLK_SELECT
GPO3 DCS_SEL RE_V2 RE_V1
TX_KEY DM_CS MQSPI_CS0 MQSPI_CLK1 DX1 DDX
Q240 B+ RE_V2 Q242 VREF Y230 VREF RE_V2 Q241
SF_OUT TX_KEY_PAC DET_SW SAT_DET VI VI_FILT
U201 GSM_SEL DCS_SEL

TX EXCITER

PAC_275 Q455

TX_VCO

D_TX_VCO G_TX_VCO SF_OUT U250 PAC_275

PA CONTROL

PAC_275 U340 SAT_DET DET_SW TX_KEY_PAC
NPA_MUTE U341 PA_B+

TX EXCITER

PA_B+ Q330 PAC_275 VCTRL DM_CS Q331 Q332
G_TX_VCO D_TX_VCO Q333 TVCO_250
U300 Q300 FL300 CR300 CR301
U400 Q400 GSM_PINDIODE DCS_PA_B+
Q303 Q304 Q305 Q306 Q307 Q308 -5V_SW
D_TX_VCO VCTRL Q301 G_TX_VCO

U200 Q201 Q202 VI_FILT DM_CS TX_EN

B+ SAT_DET DET_SW TX_KEY_PAC

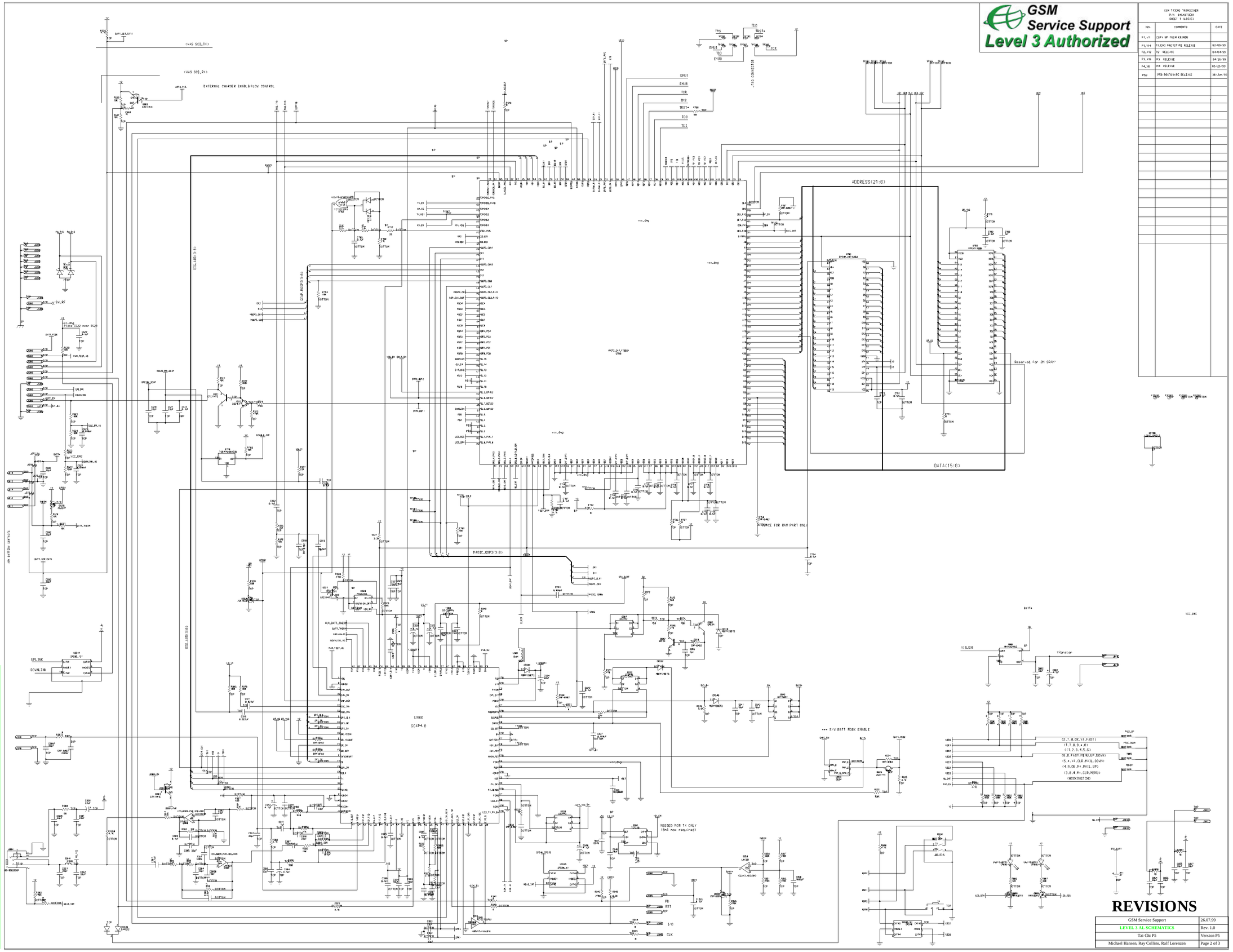
GSM_SEL C111 B5R6P 01-11740-0E50

B+ -5V TX_EN RX_EN VREF VI

FAI IS ACTUAL CORRECT PART

REVISIONS

GSM Service Support	16.11.99
LEVEL 3 RF SCHEMATICS	Rev. 1.1
Tai Chi P5	Version P5
Michael Hansen, Ray Collins, Ralf Lorensen	Page 3 of 3


GSM Service Support
Level 3 Authorized
TAI CHI - Organiser V.P5
GSM TAICHI TRANSCEIVER
P/N: 6461471C01
SHEET 1 (LOGIC)
REVISIONS
GSM Service Support 26.07.99
LEVEL 3 AL SCHEMATICS Rev. 1.0
Tai Chi P5 Version P5
Michael Hansen, Ray Collins, Ralf Lorenzen Page 2 of 3
ADDRESS(21:0)
DATA(15:0)
JTAG CONNECTOR
Reserved for 2M SRAM
Vibrator
U500
GCAP4-L6
NEEDED FOR TX ONLY
(8mA max required)
*** S/W BATT PDBK ENABLE
EXTERNAL CHARGER ENABLE/FLOW CONTROL
(WAS SCI_TX)
(WAS SCI_RX)

TAI CHI - Organiser V.P5

RX SIGNAL PATH
TX SIGNAL PATH
MAIN VCO SIGNAL PATH
TUNING VOLTAGES
13 MHz REFERENCE CLOCK
DATA BUS
ADDRESS BUS
TEXT REFERENCE SIGNALS

GSM Service Support
Level 3 Authorized

GSM TAICHI TRANCEIVER
P/N: 0404716C01
SHEET 1 (LOGIC)

REV.	COMMENTS	DATE
P1_r1	COPY OF FROM KEIMER	
P1_r14	TAICHI PROTOTYPE RELEASE	02/09/99
P2_V2	P2 RELEASE	04/04/99
P3_V6	P3 RELEASE	04/26/99
P4_r8	P4 RELEASE	05/25/99
P5B	P5B PROTOTYPE RELEASE	30/Jun/99

WHITECAP
U700

GCAP 4.0
U900

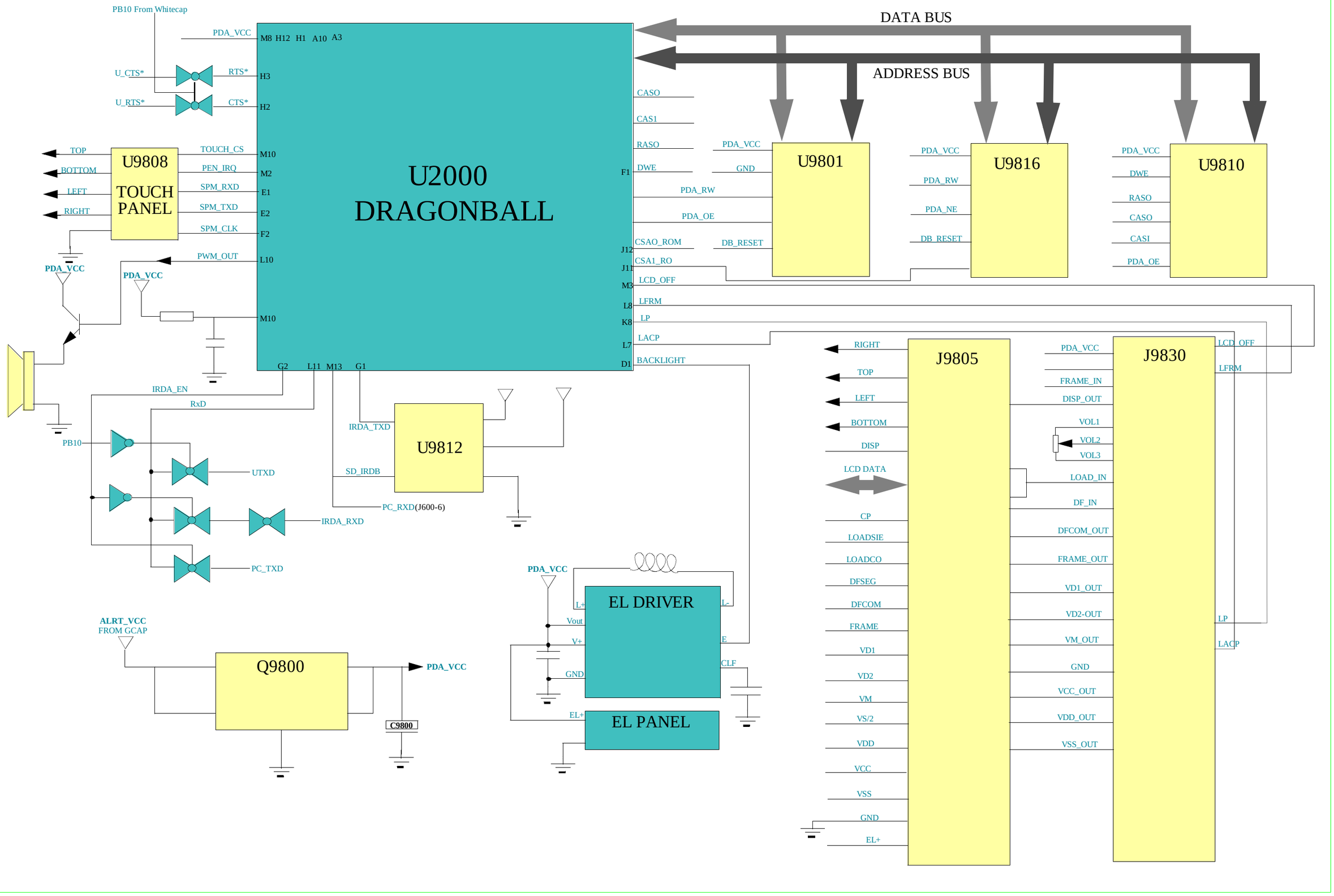
U701
EPROM

U702
SRAM

ADDRESS (21:0)
DATA (15:0)

REVISIONS

Europe Middle East & Africa Customer Services	26.07.99
LEVEL 3 AL SCHEMATICS	Rev. 1.0
Tai Chi P5	Version P5
Michael Hansen, Ray Collins, Ralf Lorenzen	Page 2 of 3


PB10 From Whitecap
PDA_VCC
M8 H12 H1 A10 A3
U_CTS*
RTS*
H3
U_RTS*
CTS*
H2
U2000
DRAGONBALL
DATA BUS
ADDRESS BUS
CASO
CAS1
RASO
DWE
F1
PDA_RW
PDA_OE
CSAO_ROM
J12
CSA1_RO
J11
LCD_OFF
M3
LFRM
L8
LP
K8
LACP
L7
BACKLIGHT
D1
U9801
U9816
U9810
PDA_VCC
GND
DB_RESET
PDA_NE
DWE
RASO
CASO
CASI
PDA_OE
TOP
BOTTOM
LEFT
RIGHT
U9808
TOUCH
PANEL
TOUCH_CS
M10
PEN_IRQ
M2
SPM_RXD
E1
SPM_TXD
E2
SPM_CLK
F2
PWM_OUT
L10
M10
G2
L11
M13
G1
IRDA_EN
RxD
PB10
UTXD
IRDA_RXD
PC_TXD
IRDA_TXD
SD_IRDB
U9812
PC_RXD(J600-6)
J9805
J9830
RIGHT
TOP
LEFT
BOTTOM
DISP
LCD DATA
CP
LOADSIE
LOADCO
DFSEG
DFCOM
FRAME
VD1
VD2
VM
VS/2
VDD
VCC
VSS
GND
EL+
PDA_VCC
FRAME_IN
DISP_OUT
VOL1
VOL2
VOL3
LOAD_IN
DF_IN
DFCOM_OUT
FRAME_OUT
VD1_OUT
VD2-OUT
VM_OUT
GND
VCC_OUT
VDD_OUT
VSS_OUT
LCD_OFF
LFRM
LP
LACP
ALRT_VCC
FROM GCAP
Q9800
C9800
PDA_VCC
EL DRIVER
L+
L-
Vout
V+
GND
E
CLF
EL PANEL
EL+

RX SIGNAL PATH
TX SIGNAL PATH
MAIN VCO SIGNAL PATH
TUNING VOLTAGES
13 MHz REFERENCE CLOCK
DATA BUS
ADDRESS BUS
TEXT REFERENCE SIGNALS

TAI CHI - ORGANISER P5b

DDR TAICHI TRANCEIVER P/N 0404372191 SHEET 3 (LOGIC)		
ISS.	COMMENTS	DATE
P1_v1	COPY OF FROM EDIMER	
P1_v14	TAICHI PROTOTYPE RELEASE	02/05/99
P2_v12	P2 RELEASE	04/04/99
P3_v1C	P3 RELEASE	04/26/99
P4_v8	P4 RELEASE	05/25/99
PCB	PCB PROTOTYPE RELEASE	05/Jun/99

IrDA

U9812 IrDA_TXRX
PDA_VCC
IRDA_TXD
IRDA_RXD
SD_IRDA

U2000 Dragon Ball

U9801 EPROM

U9816 EPROM

U9810 DRAM

LCD Connector

PDA POWER SECTION

REVISIONS

Europe Middle East & Africa Customer Services	28.10.99
LEVEL 3 PDA SCHEMATICS	Rev. 1.1
TAI CHI Organiser	Ver P5b
Michael Hansen, Ray Collins, Ralf Lorenzen	

GSM Service Support
Level 3 Authorized

8464373E01 REV P9 SCHEMATIC SHEET4

CHANGED FROM 8464373E01 REV P8

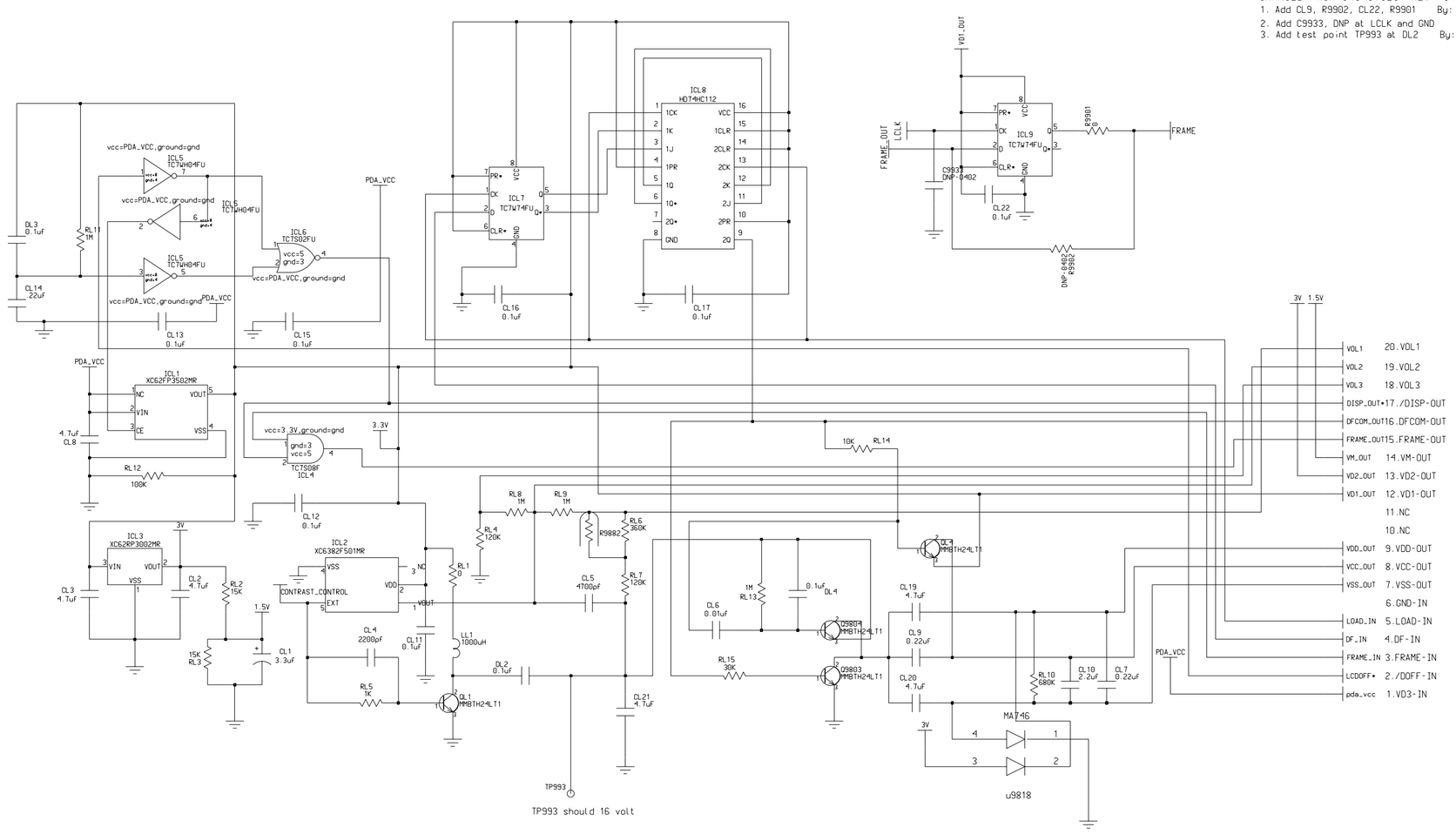
1. Change all parts to MOTOROLA Part No.
2. Remove R9870 since no Motorola P.N
3. Change ICL5 package to same with ICL7 package

Changed by: CC Wang, 10/20/99

8464373E01 REV 0.V8 SCHEMATIC SHEET1 17/Nov/99

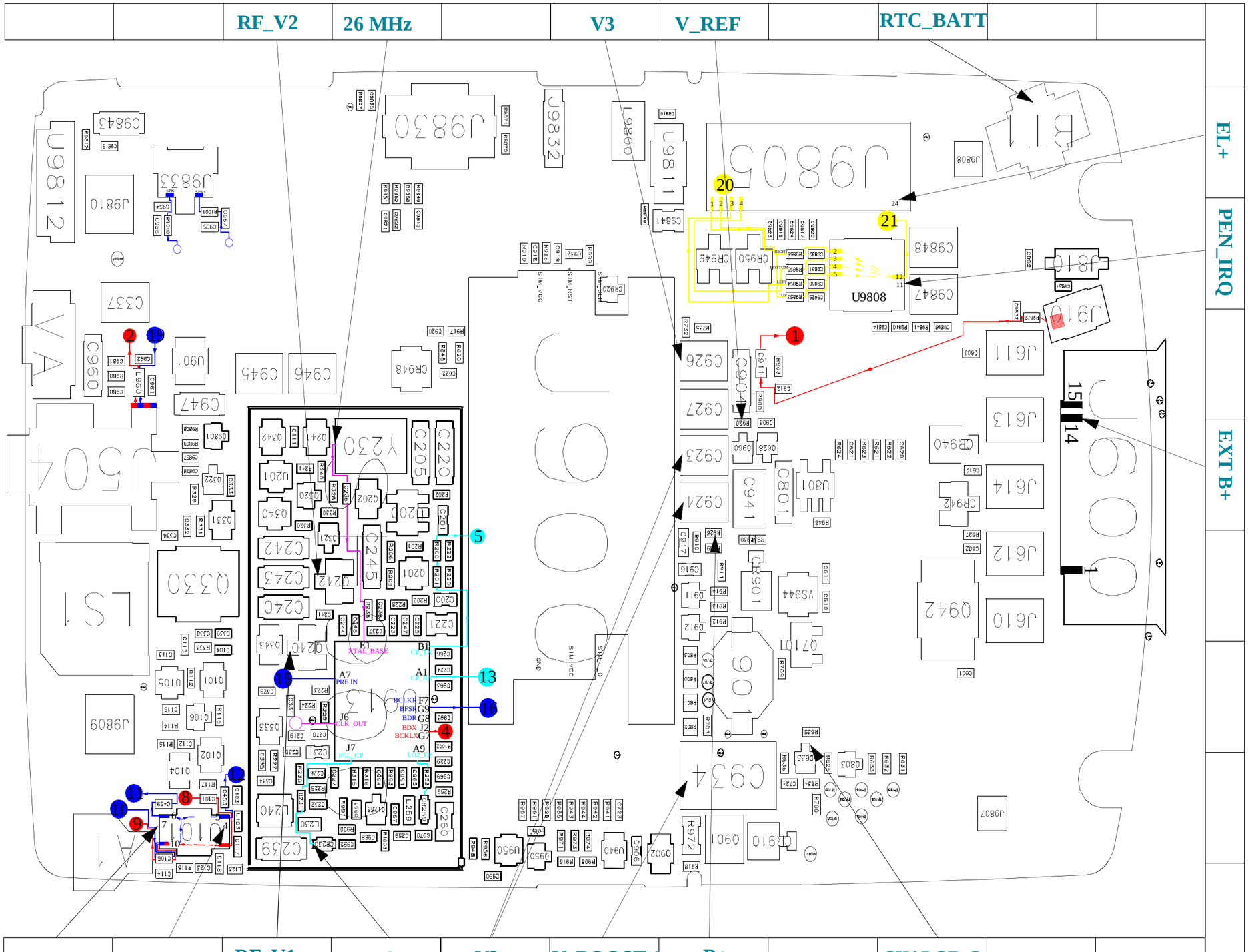
CHANGED FROM 8464373E01 REV P9

1. Add CL9, R9902, CL22, R9901 By: CC Wang
2. Add C9933, DNP at LCLK and GND By: Bob Huo
3. Add test point TP993 at DL2 By: CC Wang



GSM TAICHI TRANCEIVER P/N 8464373E01 SHEET 4 (LCD)		
ISS.	COMMENTS	DATE
P6B	P6B PROTOTYPE RELEASE	08/16/99
P7	PROTOTYPE RELEASE	09/02/99
P8	PROTOTYPE RELEASE	09/28/99
P9	PROTOTYPE RELEASE	10/20/99
0.V8	INITIAL RELEASE	17/NOV/99

TAI CHI ORGANISER



TX

1. Analogue Mic Audio.
2. Analogue Headset Audio.
3. GCAP Bus Digital Audio.
4. Processed speech and error correction data.
5. TX VCO Tuning voltage with modulation.
6. GSM 1800 main TX o/p frequency
7. GSM 900 main TX o/p frequency
8. Amplified Main TX o/p
9. Main TX o/p to Antenna

RX

10. Received Frequency

12. GSM900 Received Frequency
13. RX VCO Tuning Voltage
14. Main VCO Frequency
15. 400Mhz IF Frequency
16. Demodulated and Digitized Received Data
17. Digital GCAP Bus Audio
18. Analogue audio to Speaker
19. Analogue Audio to Headset

PDA

20. PDA Touch screen analogue positional information.
21. PDA Touch Screen digital positional information.

Motorola Use Only

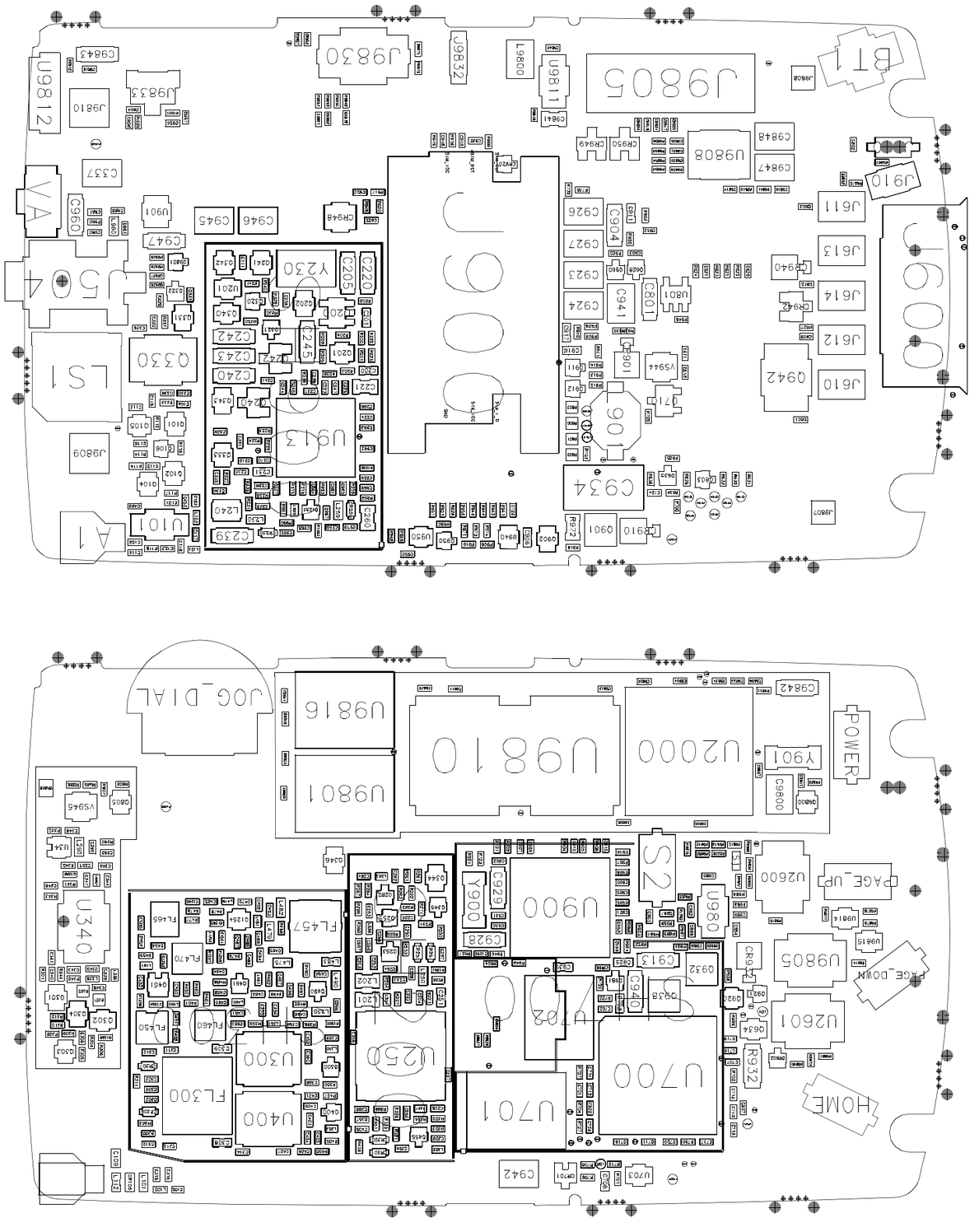
GSM Service Support
Level 3 Authorized

REVISIONS

GSM Service Support	08.12.99
LEVEL 3 SIGNAL FLOW	Rev. 1.0
TAI CHI Organiser	Ver P5.0
Michael Hansen, Ray Collins, Ralf Lorenzen	

GSM Service Support
Level 3 Authorized

TAI CHI - Organiser P5.0



EUROPE MIDDLE EAST & AFRICA CUSTOMER SERVICES	26.07.99
LEVEL 3 LAYOUT	Rev. 1.0
Tai Chi - Organiser	Ver P5.0
Ray Collins, Ralf Lorenzen, Michael Hansen	Page1

TAI CHI - ORGANISER P5.0

GSM Service Support Level 3 Authorized

A1

GSM_LNA275

GSM LNA

FL460 925-960MHz — Q461 — FL470 925-960MHz

MIX_275

Q1254 Q1254

1805-1880MHz FL450 — Q451 — FL465 1805-1880MHz

DCS_LNA

DCS_LNA275

EXT ANT SW_RF from J600

U101

Q101 / Q102 SWITCH CONTROL CIRCUIT

MIX_275 PAC_275

EGSM: 880-915Mhz
DCS: 1710-1785MHz

B+ DM_CS Q330 PA_B+

FL300

U300 DCS PA — Q300 — CR300

U400 GSM PA — Q400 — CR301

Q455

CR306,307

GSM_PINDIODE

-5V_SW SHIFT LEVEL CIRCUIT PAC_275 G_TX_VCO D_TX_VCO

U340 PAC (DET, SAT.)

RF_IN PAC_275 NPA_MUTE U341 PA_B+

DET_SW AOC_DRIVE SAT_DETECT TX_KEY_OUT

EGSM: 880-915Mhz
DCS: 1710-1785MHz

EGSM: 1325-1360MHz
DCS: 1405-1480MHz

RVCO_250

RX VCO — Q262 — Q253 Q255

DCS_VCO — CR251 CR250 C257 Inductive layer

U250 TX VCO

V1_FILT TX LOOP FILTER

DM_CS TX_EN

SF_OUT Q343 TX_EN

TVCO_250 (GSM / DCS SELECT)

RVCO_250 (RX VCO, GSM/DCS SELECT)

PAC_275 G_TX_VCO D_TX_VCO

RX LOCAL OSCILLATOR

Osc. discrete circuty Q1255 — CR259 — 800MHz — RF_V1

FL457 400 MHz — Q490 — SW_VCC

RF_V2 Q242

B+ RF_V1 Q240

U913 MAGIC

PLL — STEP ATT. — PHASE DETECTOR — A/D — RX SPI

(SCLK_OUT) BCLKR
(SDFS) BFSR
(SDRX) BDR
to WhiteCap

SWITCH — REG.

VRef

PHASE DET / PLL — 13MHz — CR230

SWITCH — SUPER FILTER — MUX

MAGIC_13MHz to WhiteCap
CLK_SELCT from WhiteCap

SF_OUT — Prog. Divider — 1 /2 — Startup Reference

PHASE DET / PLL — REFERENCE OSCILLATOR — 26MHz — Y230

V1 DCS_SEL

LOGIC CONTROL — SPI INTER FACE

(CE) MQSPI_CS1
(SPI_CLK) MOSPI_CLK1
(SPI_DATA) DX1
from WhiteCap

GP04 Q344

MODULATION — TX SPI

(SDTX) BDX
(TX_CLK) BCLKX

DETECT_SW AOC_DRIVE SAT_DETECT TX_KEY_OUT

PA CONTROL — LOGIC CONTROL

RX_ACQ DM_CS TX_KEY
from WhiteCap

NPA_MUTE
TVCO_250
PAC_275
DCS_VCO
MIX_275
GSM_LNA275
DCS_LNA275
G_TX_VCO
D_TX_VCO
GSM_PINDIODE

GSM / DCS SELECT CIRCUIT

EUROPE MIDDLE EAST & AFRICA CUSTOMER SERVICES	25.10.99
LEVEL 3 RF Block Diagram	Rev. 1.1
TAI CHI ORGANISER	
Ralf Lorenzen, Michael Hansen, Ray Collins	Page1

RX SIGNAL PATH
TX SIGNAL PATH
MAIN VCO SIGNAL PATH
TUNING VOLTAGES
REFERENCE CLOCK
Orderable Part
Non - Orderable Part

TAI CHI - Organiser

U700 WHITE_CAP

KEYPAD DISPLAY INTERFACE
SPI INTERFACE
SIM INTER FACE
CTM MODULE
CPU
MEMORY INTERFACE
SERIAL INTER FACE
DSP
CTM
A / D CHARGE
DSC
UART INTERF.
SPI INTERFACE
TIMER

HEAD_INT
(Keyboard) KBR0, KBR1, KBR2
KBC0, KBC1, KBC2, KBC3
BKLT_EN
DP_EN
HS_INT
VIB_EN
LED_RED
LED_GRN
LS1_IN
LS2_IN
LS3_TX
LS3_RX
CLK_SELCT
TX_EN
DM_CS
TX_KEY
RX_EN
RX_ACQ
RESET
(SDTX) BDX
(TX_CLK) BCLKX
from / to MAGIC
(SCLK_OUT) BCLKR
(SDFS) BFSR
(SDRX) BDR
Baseband to Digital Speech

V2
V3
(CE) MQSPI_CS1
(SPI_CLK) MOSPI_CLK1
(SPI_DATA) DX1
(MAGIC SPI)

DATA BUS
ADDRESS BUS

(Flip Con.) R_W
U702 SRAM
U701 EPROM EEPROM
CE2
CE3
R_W
RESET
CE0
CE1

-5V_EN
LS_V1
U901
-5V
STDBY
DEEP SLEEP CIRCUIT
V1

PRESENCE DETECT

BATT CONNECTOR
J611 BATT +
J614 N/C
J610 BATT_THERM
J613 BATT_SER_DATA
J612 GND

(WhiteCap) VIB_EN
B+
U801
J810

KBC0 HOME
KBR0 PAGE UP
KBR1 PAGE DOWN
ON / OFF POWER ON / OFF
KBR0 VA
CCW CW
KBC1 Jog Switch KBR2

(GCAP2) V2
LED_RED (WhiteCap) LED_GRN
Q805

J 600

15 PIN EXT CONN.

DSC_EN_B+ 13
PC_RXD 6 From PDA
PC_TXD 7 To PDA (for RS232)
BATT FDBK 4
EXT_B+ 14 EXT_B+
SW_RF 2
URTS_PA6 8 Ext Charger_En
On/Off 9
GND 1
GND 3
GND 10
GND 15
MAN_TEST_AD 5 (Ext Accessory Sense)
VS944
UPLINK 11
DOWNLINK 12

UTXD URXD To / From PDA
ON / OFF (From Switch)
CR920

AUDIO SPI
GCAP SPI
GCAP_CLK 13 MHz
GCLK 32.768 KHz
MAGIC_13MHz
RTC_BATT
RTC BATT
BT2
Y633

EXT B+
U970 Q970
CR940
Q942
B+
BATT +
R932
Q932
CR932
BATT +
CHRG_EN
Q634
Q635
I SENSE
CHRGC
BATT+
EXT_B+
BATT FDBK

SPI INTERFACE
REAL TIME CLOCK
SELECT
SENSE CNTL
LEVEL SHIFT
U900
G_CAP2
SENSE CNTL.
DSC_EN_AD
DOWNLINL_AD
BATT_THERM
ISENSE
CLK
RST
SIM_I/O
J900 SIM Con.
VSIM1
LS1_IN
LS2_IN
LS3_TX
LS3_RX
PWR_SW
STDBY
RESET
Logic Control

VREF REG. VREF 2.775V,for MAGIC
V3 REG. V3 1,8V, for WhiteCap
V2 REG. V2 2.775V, for WhiteCap logic outputs, RAM, FLASH, EEPROM
V1 REG. LS_V1 5.0V, for DSC Bus, Negative Voltage Regulator
VSIM REG. VSIM1 3.0 or 5.0V, for SIM Card Circuit
VBOOST1 REG.

MIC J910
HEADSET J504
U980
U980
Interface Audio Codec
PA_DRV
SPR-
SPR+
SPKR J9833
ALRT_VCC TO PDA
Q938
L901
CR901
V_BOOST1 Internal GCap use only (VSIM1, LS_V1)
B+
BKLT_EN
Q938
BKLT+ (Flip Con.)

GSM Service Support Level 3 Authorized

RX SIGNAL PATH
TX SIGNAL PATH
MAIN VCO SIGNAL PATH
TUNING VOLTAGES
REFERENCE CLOCK
Orderable Part
Non - Orderable Part

EUROPE MIDDLE EAST & AFRICA CUSTOMER SERVICES	18.10.99
LEVEL 3 AL Block Diagram	Rev. 1.1
Dualband Tai Chi Organiser	
Ralf Lorenzen, Michael Hansen, Ray Collins	Page1

GSM Service Support
Level 3 Authorized

TAI CHI - ORGANISER P5.0

GSM LNA

DCS LNA

RF SWITCH
Ref #'s 100-150

Ref #'s 450-469

Ref #'s 470-489
MIXER

L479, L482 SHOULD BE 24-09350L SERIES

Ref #'s 490-500
ISO. AMP

Ref #'s 300-350

Ref #'s 100-150

Ref #'s 450-500

RX VCO

TX_EXCITER

TX_VCO

P.A. CONTROL

NOTE:
All other connections are ground.

F11 IS ACTUAL CORRECT PART

GSM TAICHI TRANSCEIVER
P.N. 84047789
SHEET 2 (B)

REV.	COMMENTS	DATE
P1_v1	COMPLETED FROM SCHEMATIC	
P1_v14	P1 RELEASE	02-09-99
P2_v12	P2 RELEASE	04-04-99
P3_v16	P3 RELEASE	04-26-99
P4_v8	P4 RELEASE	05-25-99
P5.0	P5.0 PROTOTYPE RELEASE	30-Jun-99

REVISIONS

GSM Service Support	26.07.99
LEVEL 3 RF SCHEMATICS	Rev. 1.0
TAI CHI Organiser	Ver P5.0
Michael Hansen, Ray Collins, Ralf Lorenzen	Page 2of 3